



Magnetic Surprises



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Overview

Why does a magnet stick to a refrigerator, but not a drinking glass? What's the difference between objects that magnets stick to and those they don't? And are there any magnetic surprises out there in the world? Let's do some investigating.

Doing the activity

Gather the plastic bags of graphite, sand, and crushed cereal from your kit. Lay the bags flat on a table or other surface (stay away from your computer, cell phone, wallet, and other items the neodymium magnet could damage), and move the neodymium magnet over the surface of the bag. Does anything in the bag stick to the magnet? Is anything surprising happening?

What's happening

Certain materials are *ferromagnetic*. These materials aren't permanent magnets on their own, but they can be *magnetized* by a strong magnetic field (check out the *Magnetic Sleuth* activity for more details on magnetic fields). Because the way a ferromagnetic object gets magnetized depends on the field it's situated within, ferromagnetic objects will be attracted to the magnetizing magnet. If a ferromagnetic object is near the south pole of a strong magnet, a north pole will be induced in the region of the object closest to the magnet (see the *Refrigerator Magnets* activity for more details on magnetic poles). Iron and iron-containing compounds (such as steel) are ferromagnetic. As you probably guessed, iron filings contain iron, and so are attracted to the magnet. Iron filings are also very small and light, and so are particularly good at helping you "see" the magnetic field. Certain cereals, such as the one in the kit, contain added iron, since humans need a certain amount of iron in their diets to be healthy. Many types of sand also contain iron and other ferromagnetic materials, and you can pull these out of the sand using the magnet.

Summing up

Objects that aren't magnets can interact with magnets in interesting ways. There may be more of these magnetizable materials in your life than you'd think!

For more information

Visit our website: www.lsop.colostate.edu

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Necessary materials:

- neodymium magnet*
- bag of iron filings
- bag of sand
- bag of crushed cereal

***Be careful with this magnet!** It's very strong, and can wipe credit cards, do bad things to cell phones, break if it "jumps" to a surface, etc.